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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference SN-17263-PCT | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) | |
| International application No. PCT/KR2002/001073 | International filing date (day/month/year) 05 JUNE 2002 (05.06.2002) | Priority date (day/month/year) 28 FEBRUARY 2002 (28.02.2002) |
| International Patent Classification (IPC) or national classification and IPC IPC7 C02F 3/30 | | |
| Applicant SAMSUNG ENGINEERING CO., LTD. et al | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of 5 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the report
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☒ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

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|--|---|
| Date of submission of the demand 29 AUGUST 2003 (29.08.2003) | Date of completion of this report 09 JULY 2004 (09.07.2004) |
| Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140 | Authorized officer WON, Jong Hyeok Telephone No. 82-42-481-5592  |

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2002/001073

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☒ the description:
 pages 1-19, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the claims:
 pages 20-22, as originally filed
 pages _____, as amended (together with any statement) under Article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the drawings:
 pages 1/6-6/6, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language _____ which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed," and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|------|-----|
| Novelty (N) | Claims | 1-7 | YES |
| | Claims | None | NO |
| Inventive step (IS) | Claims | 1-7 | YES |
| | Claims | None | NO |
| Industrial applicability (IA) | Claims | 1-7 | YES |
| | Claims | None | NO |

2. Citations and explanations (Rule 70.7)

1) Reference is made to the following documents;

D1: JP 08-243587 A

D2: US 6,054,044 A

2) D1 discloses the baffle walls that are formed respectively close to the outlet end of a nitrification tank and close to the inlet end of a settling tank to provide a method for circulating nitrified solution and carrier by which a power for circulating the nitrified solution is reduced. In this invention, dissolved oxygen is not brought into a denitrification tank, and the carrier concentration in the denitrification tank and nitrification tank is maintained constant at all times.

D2 discloses the system for treating wastewater to provide an anoxic culture, an anaerobic culture, and aerobic culture to which wastewater is exposed sequentially. The aerobic culture may be provided such that conditions cycle from aerobic to anoxic.

3) None of the cited prior art discloses a wastewater treatment apparatus according to Claim 1 that has a baffle installed to form a dissolved oxygen reducing zone. Therefore, subject-matter of Claim 1 and its dependent Claims 2 to 5 respectively is novel over the cited prior art.

Also the prior art is also not disclosing a wastewater treatment method in accordance with Claim 6 which includes the process comprising the reducing the content of dissolved oxygen by returning the wastewater to the dPAO tank and increasing the content of dissolved oxygen contained in the treated effluent. Therefore, subject-matter of Claim 6 and its dependent Claims 7 respectively is novel over the cited prior art.

The subject-matter of Claims 1 to 7 does therefore meet the requirements of Article 33(2) PCT.

(Continued on Supplement Box)

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VI. Certain documents cited

1. Certain published documents (Rule 70.10)

| <u>Application No. Patent No.</u> | <u>Publication date (day/month/year)</u> | <u>Filing date (day/month/year)</u> | <u>Priority date (valid claim) (day/month/year)</u> |
|---------------------------------------|--|---|---|
| KR 2002-44820 A | 19/06/2002 | 06/12/2000 | 28/02/2002 |

Document KR 2002-44820 A, filed on 06/12/2000, published on 19/06/2002 with a claimed priority date of 28/02/2002 (validity not checked) does not constitute prior art within the meaning of PCT Rule 64.1(b), but appears to disclose all the features of claims 1, 3, 6 and 7.

2. Non-written disclosures (Rule 70.9)

| <u>Kind of non-written disclosure</u> | <u>Date of non-written disclosure (day/month/year)</u> | <u>Date of written disclosure referring to non-written disclosure (day/month/year)</u> |
|---------------------------------------|--|--|
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Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of:

Box V.

- 4) It would appear that the claimed subject-matter is based upon an inventive step.
The prior art processes have to install the dissolved oxygen removal tank which is disadvantageous from the viewpoints of cost and time. It has surprisingly been found that a technically uncomplicated process for reducing the concentration of dissolved oxygen contained in internally recycled wastewater returned from a dissolved oxygen reducing zone while increasing the concentration of dissolved oxygen contained in treated effluent supplied from a part other than the dissolved oxygen reducing zone of the aerobic tank to a clarifier in a subsequent stage. In doing so the retention time in the reaction tank can be reduced, thereby reducing the construction cost of a wastewater treatment equipment. Consequently, the claimed subject-matter must be considered to be non-obvious and thereby to involve an inventive step.
Therefore, the subject-matter of Claims 1 to 7 would appear to meet the requirements of Article 33(3) PCT.
- 5) It would appear that the claimed subject-matter is industrially applicable.
Therefore, the subject-matter of Claims 1 to 7 meets the requirements of Article 33(4) PCT.